CALIFORNIA DIVISION OF MINES AND GEOLOGY

Fault Evaluation Report, FER-30

March 2, 1977

1. Name of fault: Rialto-Colton Fault.

2. Location of fault: Vicinity of Rialto, San Bernardino County, in Devore, Fontana, and San Bernardino North 7.5' quadrangles (see figures 1 and 2 attached).

3. Reason for evaluation: Request from City of Rialto (attached letter of 12/3/76 from R.E. Downing); also, area lies within 1977 study-area of CDMG Fault Evaluation Program and fault has been tentatively zoned as a potentially hazardous fault by the City of Rialto.

4. References:

a) Cramer, C.H., and Real, C.R., 1977, Unpublished map showing seismicity near Cucamonga fault, 1974-1976 (Computer-printout data prepared by Chris Cramer and Chuck Real).

b) Dutcher, L.C., and Garrett, A.A., 1963, Geologic and hydrologic features of the San Bernardino area, California: U.S. Geological Survey Water-supply Paper 1419, 114 p., 19 plates.

c) Environmental Feasibility Studies, 1976, Draft EIR--West Coast to Mid-Continent Pipeline project, v. 2, pt. 1, Pipeline from Long Beach to Colorado River; prepared for the Port of Long Beach and California Public Utilities Commission, September 1976. [Only Tables II-24 & Maps II-14 and -16 available for reference]

d) Fife, D.L., 1977, Personal communication.

e) Hadley, D., and Combs, J., 1974, Microearthquake distribution and mechanisms of faulting in the Fontana-San Bernardino area of southern California: Bulletin of the Seismological Society of America, v. 64, p. 1477-1499.

f) Hart, E.W., 1977, Fault hazard zones in California: California Division of Mines and Geology, Special Publication 42 (Revised), 24 p.

g) Jennings, C.W., 1975, Fault Map of California with locations of volcanoes, thermal springs, and thermal wells: California Division of Mines and Geology, Geologic Data Map no. 1 (scale 1:750,000).

h) Leighton and Associates, 1972, Geologic feasibility investigation on Tentative Tract 8433, Lots 1-39, Willow and Randall Avenues, Rialto, CA; Unpublished report dated June 15, 1972, for S & J Industries, 5 pages.

i) Morton, D.M., 1976, Generalized geologic and fault maps of southwestern San Bernardino County in Fife, D.A., and others, Geologic hazards in southwestern San Bernardino County, California: California Division of Mines and Geology, Special Report 113, Plate 1A, 1B, 2A, and 2B.

j) Rasmussen and Associates, 1976a, Engineering geology investigation, Laurel High School, SE corner Laurel Avenue and Baseline, Fontana, CA: Unpublished report for CHJ Materials Laboratory, dated August 25, 1976, 11 p., plus illustrations; with appended report by Earth Science and Engineering on Gravity survey for two school sites.

k) Rasmussen, and Associates, 1976b, Engineering geology investigation, 30 lots, NE corner of Willow Avenue and Wilson Street, Rialto, California: Unpublished report of December 9, 1976, for Jason Construction Company, 11 p., plus illustrations.

1) Rasmussen and Associates, 1976c, Engineering geology investigation, 100' x 200' warehouse, NW corner of AT & SF Railroad & Lilac Avenue, Rialto, CA: unpublished report of December 10, 1976, for Pacific foods, 11 p. plus illustrations.

5. Summary of available data:

The so-called Rialto-Colton fault is hypothesized to explain the observed groundwater anomaly in the Rialto-Colton area. This anomaly is identified and described as the "Rialto-Colton barrier" (also known as Barrier J) by Dutcher and Garrett (1963, p. 38-40). The barrier is shown to be a subsurface feature nearly 7 miles long and is described as approximately located and not traceable to the southeast. It is truncated to the northwest by another barrier. Dutcher and Garrett (plate 7) indicate that the barrier is probably a fault that offsets the water table at a depth of less than 200 feet. However, they (p. 38) state that this barrier has no surface expression and show the fault to be concealed under alluvial deposits of Holocene and Pleistocene ages. They do not speculate on the type and amount of displacement along this assumed fault. However, Rasmussen (1976c) states that well-data indicates that basement rock is 2000 feet deep northeast of the fault (barrier) and only 800 feet southwest of it in the Rialto area.

Other workers have attempted to evaluate this barrier as a fault, including Fife, D.L. (1977), Leighton (1972), Morton (1976), and Rasmussen (1976a, b, c,). There is some geological and geophysical evidence to indicate the existence of one or more faults in the subsurface (Rasmussen, 1977a), but trenching at 2 sites in Rialto indicates no observable fault within 10 to 12 feet of the surface (Rasmussen, 1976b and 1976c). To the south-

east along the projected trend of the barrier and south of Highway I-10, Rasmussen (1976b) reports that Dames and Moore (consultants) identified a 40-50 foot deep resistivity anomaly but that no fault was found in a verifying trench 10 feet deep and 580 feet long. [The Dames and Moore investigation was done for Environmental Feasibility studies, 1976.]

None of the investigators indicate the existence of air photo lineaments or any surface evidence of faulting along the identified "trace" of the Rialto-Colton barrier.

Microseismic studies in the area surrounding Rialto also fail to demonstrate that the Rialto-Colton barrier is an active fault. Hadley and Combs (1974) monitored the region at times during 1972 and 1973 and recorded 55 microseismic events in the Rialto-Fontana area. Of these, 45 events cluster to generally define two northeast-trending zones: one along the Fontana water barrier (fault) and the other along an otherwise unknown fault. Only a few of the events were located within 1 to 2 miles of the hypothetical Rialto-Colton fault.

Cramer and Real (1977) also show epicenters for all known seismic events during 1974-1976 for the region around Rialto (see figure 4). These epicenters tend to cluster along the San Jacinto fault and north of the Cucamonga fault. Other epicenters are scattered in the Chino basin, west and south of the above-named faults, and do not uniquely support the existence of a specific fault along the Rialto-Colton barrier. In fact, faulting is suggested elsewhere with the Chino basin, based on a northeast-trending seismic zone west of Fontana and an equidimensional cluster of epicenters centered 3-4 miles south of Rialto.

Both Jennings (1975) and Environmental Feasibilities Studies (1976) classify the Rialto-Colton barrier as a concealed Quaternary fault, but

neither provide any information in addition to the references cited above.

6. Interpretation of aerial photos: Not considered necessary; others who have interpreted photos report the lack of surface features associated with the barrier (Fife, 1977; Leighton, 1972; Rasmussen, 1976a,b.c).

7. Field observations: None.

8. Conclusions:

Based on the work of Dutcher and Garrett (1963) and Rasmussen (1976b) it seems likely that the Rialto-Colton groundwater barrier is due to faulting that extended into the older alluvium (late Pleistocene age) in the subsurface. However, the fault(s) is not detectable at or near the ground surface, apparently the fault either is a poorly-defined feature or is not sufficiently active to disturb the surface alluvium (including older (late Pleistocene?) alluvium). Further, recent seismicity in the Rialto area does not align with the barrier, although other faults are suggested. Available evidence indicates that the Rialto-Colton barrier (fault) is not sufficiently active and well-defined to constitute a hazard from surface fault rupture (Hart, 1977, p. 7).

9. Recommendations: It is recommended that the Rialto-Colton barrier (fault) not be zoned for Special Studies under the Alquist-Priolo Special Studies Zones Act, based on available information. If significant new data becomes available, then these conclusions and recommendations should be re-evaluated.

10. Investigating geologist:

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March 2, 1977